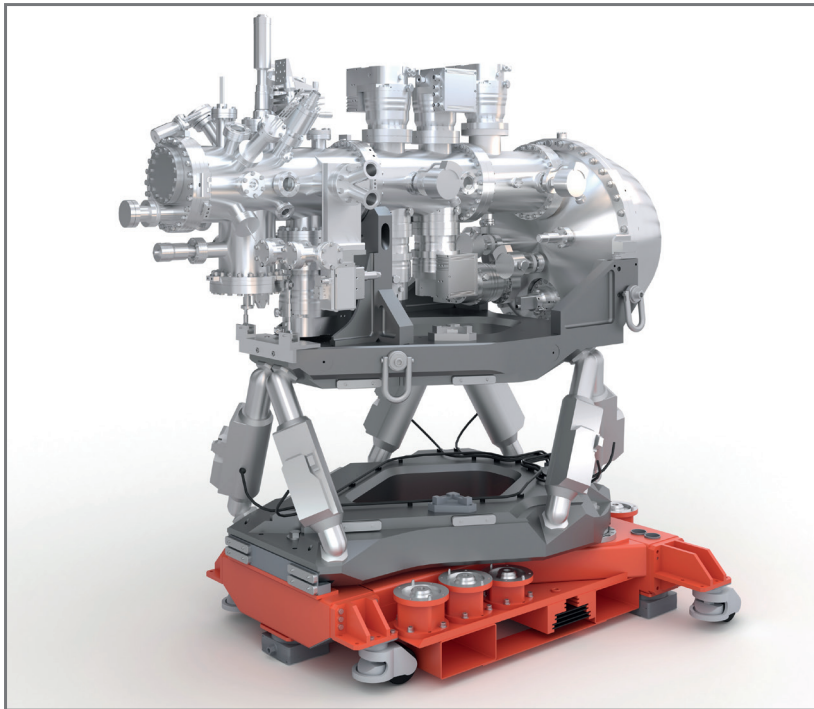


BAR XPS

For studies of industrially relevant catalytic reactions



It is estimated that up to 90% of chemical products are produced via catalysis. Many heterogeneous catalytic reactions occur at high pressures and temperatures. To study these types of catalytic reactions, researchers at Stockholm University have constructed an instrument capable of measuring XPS under conditions of > 1 bar of pressure in the vicinity of the catalytically reactive surface.

Peter Amann and Anders Nilsson, et. al. present the instrument, which consists of a HiPP analyser, in the Review of Scientific Instruments article 'A high-pressure X-ray photoelectron spectroscopy instrument for studies of industrially relevant catalytic reactions at pressures of several bar'.

The performance of the instrument is demonstrated by measuring bulk 2p spectra from a

copper single crystal at He pressures of up to 2.5 bar and C 1s spectra in gas mixtures of CO + H₂ at pressures up to 790 mbar. The capability of the instrument opens up the possibility of operando studies of heterogeneous catalytic reactions under industrial manufacturing conditions.

This 1 Bar XPS system solution is now available from Scienta Omicron.

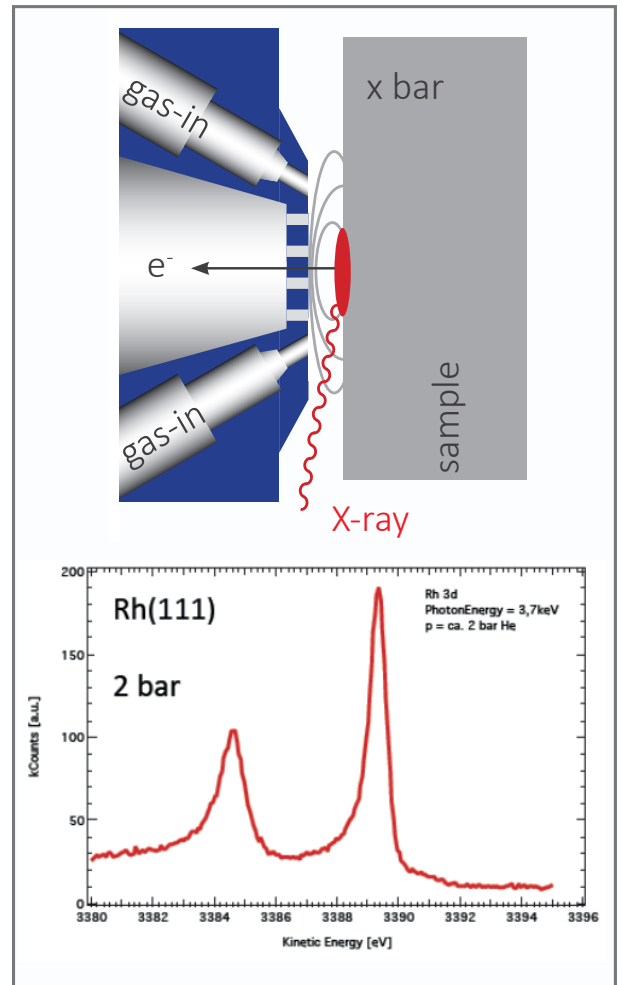


Figure 1: The Scienta Omicron Bar XPS design was developed by Anders Nilsson and Peter Amann at Stockholm University. Bar XPS uses the virtual gas cell design, which creates a high local pressure area around the sample of > 1 bar (a), (b) shows a Rh 3d spectra recorded at 2 bar He pressure. Left: a schematic figure of the system.

BAR XPS advantages:

- Study of catalytic reactions
- Measuring XPS under conditions of > 1 bar of pressure
- Open up the possibility of operando studies of heterogeneous catalytic reactions under industrial manufacturing conditions